Hospital Multi-Parameter Patient Monitoring Application

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GitHub Repository: https://github.com/Alphonso74/Patient-Monitory-Application-

Project Idea

Our project idea is a Hospital "Patient Monitoring Application". We would create an application that doctors, nurses, and hospital receptionists would be able to use in order to monitor patient medical conditions and statuses live all at the same time on one feed. In the main feed display, doctors and nurses will be able to visibly see medical data for each patient as well as live monitored data such as the patient's heartbeat rate, blood pressure, and body temperature. If a doctor or nurse clicks directly on a patient icon, they are able to see a full digest of the patients' patient information such as the diagnosis, sleep patterns, diet, pain level, amounts of fatigue, and amount of nausea, etc. When a patient is admitted into the hospital the receptionist has the duty of entering all of the patient data into the applications database.

Each patient is marked with a Triade tag by first responder or medical personnel upon admission into the hospital. This will determine the type of alerts that are sent through notifications or windows on the feed. This will also affect the medical simulator for the patient's dynamics data.
- Black (Expectant) - Pain medication only, until death
- Red (Immediate) - Life-threatening injuries
- Yellow (Delayed) - Non-life-threatening injuries

▪   Green (Minimal) - Minor injuries

If a patient's status gets critical, for instance if their heartbeat rate gets too high or too low, all users of the application signed into an account for that specified hospital will be notified with an alert with corresponding details and instructions. The corresponding patient's icon on the feed changes automatically when this happens to be bright red, and certain significant information prominent to the condition are displayed upfront to that user's data field on the feed.

We also want to include a direct messaging feature for hospital personnel. Doctors, Nurses, and receptionists will have the ability to direct message one another directly in this app with their account. This feature would be great when a doctor is on the opposite side of the hospital from a patient and needs to communicate with a nurse on the other side, or nurse to nurse communication.

The application will have multiple feeds that a user can utilize depending on the department within the hospital such as the neonatal department where the feed would be monitoring infants. The three different feeds we came up with were the infant (post birth), post operation patients, and general care patients.

We will have a feature that allows nurses and doctors to "chart" directly into the application which would get saved to a database table for that patient. Each chart entry would have the ability to be looked up by any verified user for any patient.

We have a nurse assignment feature now that gives specific users the ability to assign nurses to patients. Once a nurse is assigned, they would then show up under the patient in the feed as the "Active nurse".

We have a "doctor standing order" feature for users that are doctors. A standing order is an order conditioned upon the occurrence of certain clinical event. All patients who meet the criteria for a standing order receive the same treatment. There are different standing orders that a doctor can make depending on the patient's condition. For example, if the patient has an extremely high pain level with an unknown condition the doctors standing order may be to increase the pain prescription medicine in order to subside that pain for the patient. These standing orders are to be viewed and followed by nurses in order to give the correct amount of medicine to patients. Thus, a doctor standing order entry for a patient would then become visible under that patient on the live feed until edited by another doctor.

The last feature we came up with is a filter for the news feed for users. This feature would allow users to filter the patients on their feed preventing any unselected or any patient that didn't fall within a certain condition from showing on their feed.

Medical Simulator

Medical data simulation will be done by utilizing time intervals as well as a probability factor. The patients Triade tag given to the patient when admitted into the hospital will also play a big role with data simulation as well. Dynamic data will fluctuate on time intervals, for instance resting heartbeat could change every minute, body temperature could change every 5 minutes, and blood pressure would change every 30 minutes for a patient. This means that each type of

dynamic data for a patient would have a timer connected to it, this data will also not be stored within a database because it is live data. Probability plays a factor when it comes to how each data field changes, and this could have a strong relationship with the patients Triade tag as well as the patient's condition coming into the hospital. For instance, a patient is admitted with a green Triade tag with the condition of a broken finger. This patient's condition wouldn't cause the patient's heartbeat rate to fluctuate dramatically, more specifically it wouldn't make the patient's body temperature or resting heartbeat drop extremely low or increase really high. The patients core dynamic data would fluctuate steadily between a set standard deviation. A normal resting heart rate for adult's ranges from 60 to 100 beats per minute. However, for athletes having a resting heart rate below 60 can be normal and even healthy. If the patients resting heart rate is 80 and that patient has a green Triade tag, then their heart rate would only fluctuate between a standard deviation of 10-15. Meaning their heartbeat would never get below 65 and never be above 95 but would randomly change to numbers in between that range. Patients who are marked with a black Triade tag standard deviation may be 40, meaning if they start with a resting heart rate of 70, their heart rate would have the ability to randomly fluctuate between 30 and 110. Nurses and doctors would be alerted about a patient's condition if for instance their heart rate stays above 100 or below 50 for more than 3 time intervals. If a patients' resting heart rate for instance stays above or below the set noncritical value then the patient will trigger a critical condition alert, this would alert nurses and doctors using the application as well as change the patient's icon from white to bright red.